Transit Planning Board
WORKING TOGETHER – CONNECTING OUR REGION

Agenda Attachment # 3 to Agenda Item # V.2.

TO: Cheryl King

FROM: John Crocker

DATE: May 22, 2008

SUBJECT: DRAFT Initial Impact of Concept 3

This document is intended to provide a preliminary examination of the potential impact of Concept 3 on the regional transportation system through modeling and other efforts underway. This is meant as a preliminary document only and focuses on activity center connectivity, increase in accessibility, and efforts to incorporate safety and congestion benefits for a cost-benefit analysis.

Background

The Transit Planning Board is currently seeking input on a vision for regional transit being called Concept 3. The Board itself has asked for analysis on the potential impact of regional transit for the Atlanta region particularly for a cost benefit type of analysis. To date, staff has been developing methodologies and working the staff at the Atlanta Regional Commission (ARC) to use the regional travel demand model to provide some idea of the impact a full regional public transit system such as Concept 3 could have on the regional transportation system. Staff is committed to bringing a full report to the Board in June.

Regional Travel Demand Modeling

ARC staff worked through February until May to code and incorporate the Concept 3 transit network into the regional travel demand model. The process and assumptions for coding are included as an associated memorandum "022608 – DRAFT Modeling Guidelines" which documents the changes between the E6 model transit network and the Concept 3 transit network. The roadway network was left unchanged. An initial run of the Concept 3 network was run leaving the 2030 population and employment unchanged from the E6 model. This Concept 3 network with no changes will be referred to as the base Concept 3 network. ARC staff was also interested in trying to develop potential scenario results and therefore proposed running the model shifting population and employment densities at various levels. This effort is documented in an associated memorandam and the full results should be ready for presentation to the Board in the June meeting. ARC and TPB staff have worked hard to develop and analyze the results of these model results and will present a full report in June. At this time, this document will provide some initial results focused upon:

1. Activity Center Connectivity
2. Activity Center Acccessibility
3. Methods for Incorporating Safety and Cost Benefit information

Activity Center Connectivity

One of the key characteristics of Concept 3 is "Activity Center Connectivity." One way to measure this characteristic is to look at the number connections, or transfers, required to reach different activity centers within the potential transit network. With thirteen major activity centers identified, there are a total of seventy-eight (78) different combinations of activity center to activity center pairs. Table 1 presents the current number of transfers required to reach each activity center from a specific activity center with the current transit network and the Concept 3 network.

Number of Transfers Required to Travel Between Activity Centers	Existing System	Concept System 3
0	12	40
1	25	33
2	24	5
3	13	0
4	4	0
Total	78	78

Table 1 – Activity Center Transfer Matrix

Table 1 reveals that there are only twelve activity center pairs in the 2008 transit network that can be reach without a transfer and that there are four pairs that require four transfers. Those four are:

1. Fulton Industrial Boulevard and Peachtree Corners
2. Peachtre Corners and North Point
3. Town Center and Fulton Indistustrial Boulevard
4. Town Center and Peachtree Corners

The network in the proposed Concept 3 vision plan has no activity center pair with more than two transfers. Over half of the activity center pair travel would potentially require no transfer and only five pairs requiring two transfers:

1. Fulton Industrial Boulevard to Buckhead
2. Fulton Industrial Boulevard to North Point
3. Peachtree Corners to Emory
4. Peachtre Corners to Fulton Industrial Boulevard
5. Southlake to Fulton Industrial Boulevard

What the pair-to-pair comparison reveals is that Concept 3 provides a fairly dense, interconnected network of services between the thirteen major activities centers that allows for convenient travel between the major centers. In other words, the transit system provides a core backbone that should provide for mobility between the the most important multi-use regional centers.

Accessibility

Another aspect of the impact of Concept 3 the Board has expressed interest in is the impact on accessibility of the different activity centers. Initial results have focused on some specific major activity centers of Downtown, Midtown, Buckhead, Perimeter Center, and Cumberland. Table 2 below presents the number and the increase in households within 30 minutes of walk to transit from these different activity centers for the existing system, the 2030 E6, and base 2030 Concept 3. The rest of the activity centers will be presented in June.

Measure	2008 Model	2030 E6	2030 Concept 3 Base	Difference – Concept 3 and 2008	Difference – Concept 3 and E6
Downtown	166,416	237,096	244,546	78,130 (46.9%)	7,450 (3.1%)
Midtown	129,514	183,656	193,202	63,687 (49.2%)	6,546 (3.5%)
Buckhead	96,741	161,652	194,190	97,448 (100.7%)	32,538 (20.1%)
Cumberland	27,364	66,188	90,341	62,976 (230.1%)	24,153 (36.5%)
Perimeter Center	44,907	74,830	107,368	62,461 (139.1%)	32,538 (43.5%)
Airport	55,458	70,285	78,245	22,787 (41.1%)	7,960 (11.3%)

Table 2 – Households within 30 minutes by transit for five activity centers

Figure 1 presents visually the increase in households within 30-minutes by transit between Concept 3 and E6 in 2030 according to the regional travel demand model.

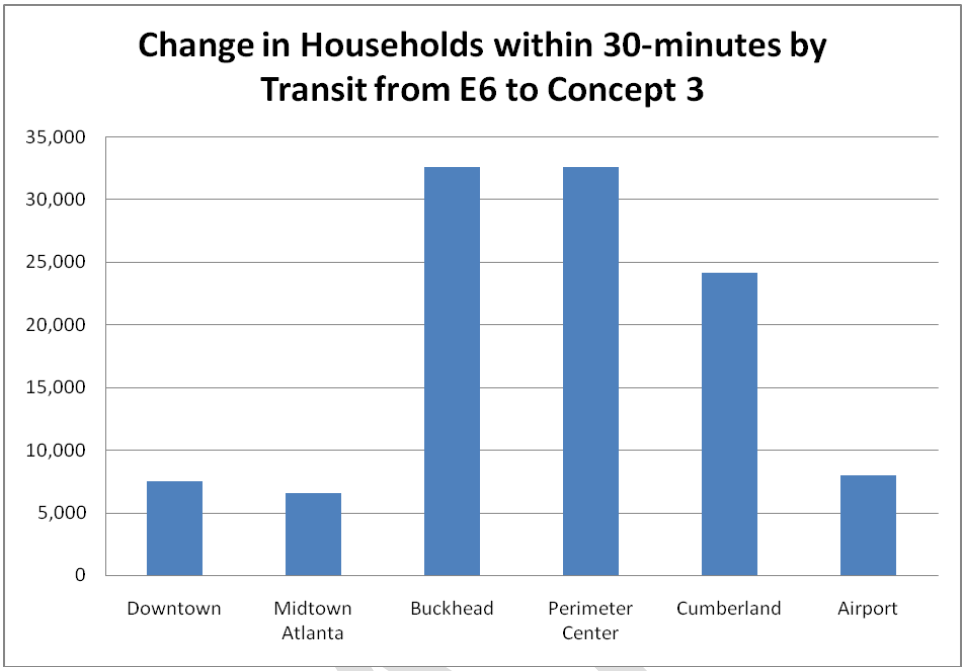

Figure 1 – Change in Households within 30-minutes by Transit from E6 to Concept 3 Networks

As Table 2 reveals, the greatest increase in accessibility by transit is occurring for the outer activity centers such as Perimeter Center and Cumberland. This trend is anticipated to hold for the further activity centers such as Town Center, Gwinnett Place and Southlake.

Safety and Approach for Initial Incorporation of Cost Beneft Information

The Board has indicated that an analysis of cost/benefit information is of particular interest. Additional focus in the region has been placed on estimating congestion relief benefit and nationally on the incorporation of safety benefits. While there are additional benefits that could be measured, staff resource and time limitations suggest that any cost-benefit information is focused on some specific areas. In this case, monetary benefits estimates will be produced for potential generalized system congestion relief and safety impacts. Congestion benefits amounts will be based on the travel demand model results from the regional travel demand model with additional supporting information for the Annual Urban Mobility Reports produced by the Texas Transportation Institute. Safety benefits will be estimated using the methodology in the associated memorandum "052208 – Safety Analysis Memo."

To test whether this approach of focusing on congestion and safety benefits would provide useful information, the approach was used on historic data from 2000 through 2005. This was the range for which both congestion benefit values were available from the Texas Transportation Institute as well as for the necessary service information used to estimate the safety benefits. The service information, primarily passenger miles traveled in the Atlanta regional transit system, was collected and readily available as part of the Performance Measures activities of the Transit Planning Board. The value of safety benefits were estimated using the values of fatal and injury crashes from the recent AAA study Crashes Vs. Congestion: What's the Cost to Society? which estimates that the

average cost, in 2005 dollars, of a fatality is $3,246,192 and the average cost of an injury is $68,170.[1] Table 3 below provides a historic cost-benefit table for the Atlanta transit system comparing operating costs of the system with the estimated congestion and safety benefits.[2]

Total Funds for Operations	2000	2001	2002	2003	2004	2005	Total (2001 - 2005)
Fares	$97,480,930	$103,735,085	$103,486,686	$101,242,526	$99,076,287	$102,183,769	$715,194,481
State	$60,002	$213,434	$1,258,266	$1,399,612	$946,087	$1,185,800	$5,689,483
Federal	$199,376	$0	$40,305,420	$45,080,188	$50,179,800	$53,347,953	$239,578,017
Other	$31,884,628	$44,121,335	$29,484,772	$28,259,097	$21,552,554	$24,776,569	$215,384,098
Local	$215,644,355	$211,731,140	$204,577,010	$231,081,086	$226,922,186	$230,414,398	$1,545,199,236
Total	$345,269,291	$359,800,994	$379,112,154	$407,062,509	$398,676,914	$411,908,489	$2,721,045,315
Cost and Benefits							
Public Funding (Total - Fares - Other Revenues)							
	$215,903,733	$211,944,574	$246,140,696	$277,560,886	$278,048,073	$284,948,151	$1,298,642,380
Estimated Value of Congestion Relief[3]							
	$174,200,000	$202,100,000	$207,600,000	$214,300,000	$237,100,000	$245,200,000	$1,280,500,000
Estimated Value of Safety Impact							
	$65,400,000	$74,400,000	$72,900,000	$66,000,000	$66,600,000	$67,200,000	$412,500,000
Estimated Value of Congestion and Safety Impact							
	$239,600,000	$276,500,000	$280,500,000	$280,300,000	$303,700,000	$312,400,000	$1,693,000,000
Ratio of Estimated Value of Congestion and Safety Impact / Public Funding							
	1.11	1.30	1.14	1.01	1.09	1.10	1.12
Estimated Avoided Fatalities							
	9	10	10	10	10	10	11
Estimated Avoided Injuries							
	643	709	678	579	550	521	531

Table 3 – Comparison of Atlanta Regional Transit System Operating Costs with Estimated Congestion and Safety Benefits ($ current year)

Table 3 reveals two pieces of information. First, the methodology used to estimate safety benefits and the value of those benefits is workable to be used to estimate the potential safety benefits of the Concept 3 model results. The next step in this estimation will be separating out the heavy and light rail boardings from the initial model results. Secondly, historically, the estimated value of the safety benefits provided by the Atlanta regional transit system are significant and the value of these savings is estimated to be greater the $65 million per year since 2000.

Next Steps and Other Issues

[1] Cambridge Systematics, Inc and Michael D. Meyer, Crashes vs. Congestion – What's the Cost to Society (Bethseda, MD, March 5, 2008).

[2] Dollar benefits amounts for the safety estimates have been adjusted to match year of estimation (i.e. the $3,246,192 in 2005 was estimated as $2,856,649 in 2000 based upon the Consumer Price Index from the Department of Labor)

[3] "Performance Measures Summary for Atlanta," 2007 Urban Mobility Report (College Station, TX). http://mobility.tamu.edu/ums/congestion_data/tables/atlanta.pdf (last accessed: May 15, 2008)

The immediate next steps for the preparation of the full report on the potential impact of Concept 3 on the regional transit system are:

1. Separating out Heavy and Light Rail Boardings from the initial model results allowing completion of safety analysis
2. Completing range of value congestion relief benefits from the Concept 3 model results
3. Completing analysis of additional accessibility for further activity centers
4. Completion of cost updating for Concept 3

Additionally, the initial results of the model run of Concept 3 revealed a strong need to quickly update the regional origin and destination survey through the on-board transit survey ARC is developing.

Points to Take Away

Several points to take away from the initial results of the analysis of Concept 3 on the regional transportation network are:

- Concept 3 improves activity center connectivity between activity centers
- Activity Centers other than Downtown and Midtown are likely to receive the greatest increase in accessibility from a regional transit network similar to Concept 3
- The estimated Safety Benefits of transit are significant
- The Atlanta region should strongly support ARC's on-board transit survey